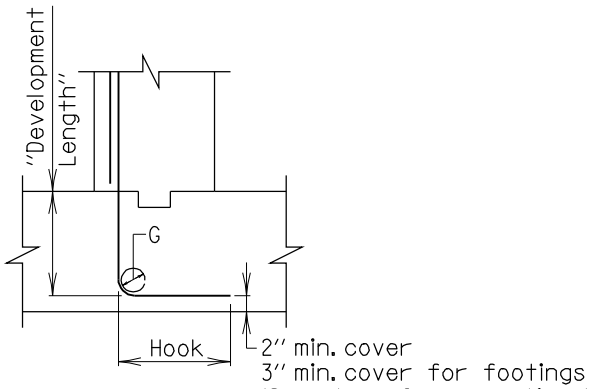
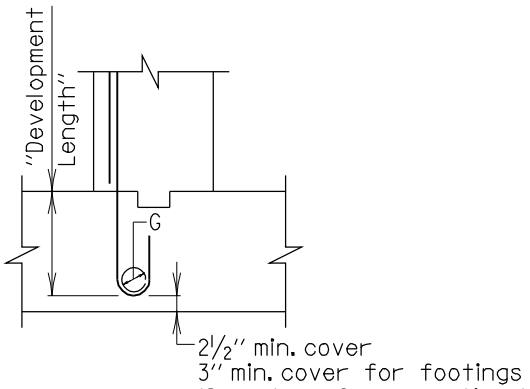


STANDARD 90° HOOK



STANDARD 180° HOOK

BAR SIZE	* LOCATION CATEGORY		
	D	E	F
#4	8"	11"	9"
#5	9"	1'-1"	11"
#6	11"	1'-4"	1'-1"
#7	1'-1"	1'-6"	1'-3"
#8	1'-3"	1'-9"	1'-5"
#9	1'-5"	1'-11"	1'-7"
#10	1'-7"	2'-2"	1'-9"
#11	1'-9"	2'-5"	1'-11"

RECOMMENDED END HOOKS ALL GRADES			
BAR SIZE	Finished bend diameter G in.	180 Degree hooks	90 Degree hooks
#4	3"	6"	8"
#5	3¾"	7"	10"
#6	4½"	8"	1'-0"
#7	5¼"	10"	1'-2"
#8	6"	11"	1'-4"
#9	9½"	1'-3"	1'-7"
#10	10¾"	1'-5"	1'-10"
#11	1'-0"	1'-7"	2'-0"

* LOCATION CATEGORY:

D- All bars terminating with a standard 180° hook with side cover (normal to plane of hook) not less than 2½", and for 90° deg. hook, cover on bar extension beyond hook not less than 2".
E- All bars not in Category D.
F- All bars with hook enclosed vertically or horizontally within ties or stirrup-ties spaced along the full development length not greater than 3d where d is the diameter of the hooked bar.

Note:
1. When development length is not specified on the Plans, the above dimensions shall be used.
2. These development lengths do not apply when bar is in lightweight concrete or any other strength of concrete.
3. These development lengths only apply where the General Notes indicate "Reinforcing Steel Design, fy = 60 ksi."
4. If depth of member does not allow bar development length indicated in Categories A, B, and C: Std. No. M(6.14)-90-214; then hook shall be added to all bars not conforming, as per D,E & F.

APPROVAL
E.S. Freedman DIRECTOR OFFICE OF STRUCTURES
DATE: 4/4/86

REVISIONS	
SHA	FHWA
11-23-93	·
1-22-01	·
9-20-05	·
11-26-07	·

FHWA APPROVAL
DATE: 6-8-90

STATE OF MARYLAND
DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
OFFICE OF STRUCTURES

VERIFIED 11-26-2007 LRFD

DEVELOPMENT LENGTH DIMENSIONS OF HOOKED BARS FOR GRADE 60 REINFORCING STEEL IN MIX NO. 3 (3500 P.S.I.) CONCRETE NON-EPOXY COATED REINFORCING

STANDARD NO. M(6.08)-86-178(L) SHEET 1 OF 1

MISCELLANEOUS